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Bitterroot River Watershed: Post Fire Monitoring. Aquatic Habitat and Invertebrate Assessment. August 2001.

Bollman, W.

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BITTERROOT RIVER WATERSHED: POST FIRE MONITORING

AQUATIC HABITAT AND INVERTEBRATE ASSESSMENT

August 2001

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A report to

The Montana Department of Environmental Quality
Helena, Montana

by

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Missoula, Montana

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INTRODUCTION

Aquatic invertebrates are aptly applied to bioassessment since they are known to be important indicators of stream ecosystem health (Hynes 1970). Long lives, complex life cycles and limited mobility mean that there is ample time for the benthic community to respond to cumulative effects of environmental perturbations.

This report summarizes data collected in August 2001 from four sites in the Bitterroot River watershed, Ravalli County, Montana. Aquatic invertebrate assemblages were sampled by personnel of the Montana Department of Environmental Quality (DEQ). Three sites lie within the Montana Valleys and Foothill Prairies (MVFP) ecoregion; the Moose Creek site appears to lie within the Northern Rockies ecoregion (Woods et al. 1999). A multimetric approach to bioassessment such as the one applied in this study uses attributes of the assemblage in an integrated way to measure biotic health. A stream with good biotic health is " ...a balanced, integrated, adaptive system having the full range of elements and processes that are expected in the region's natural environment..." (Karr and Chu 1999). The approach designed by Plafkin et al. (1989) and adapted for use in the State of Montana has been defined as "... an array of measures or metrics that individually provide information on diverse biological attributes, and when integrated, provide an overall indication of biological condition." (Barbour et al. 1995). Community attributes that can contribute meaningfully to interpretation of benthic data include assemblage structure, sensitivity of community members to stress or pollution, and functional traits. Each metric component contributes an independent measure of the biotic integrity of a stream site; combining the components into a total score reduces variance and increases precision of the assessment (Fore et al. 1995). Effectiveness of the integrated metrics depends on the applicability of the underlying model, which rests on a foundation of three essential elements (Bollman 1998). The first of these is an appropriate stratification or classification of stream sites, typically, by ecoregion. Second, metrics must be selected based upon their ability to accurately express biological condition. Third, an adequate assessment of habitat conditions at each site to be studied is needed to assist in the interpretation of metric outcomes.

Implicit in the multimetric method and its associated habitat assessment is an assumption of correlative relationships between habitat parameters and the biotic metrics, in the absence of water quality impairment. These relationships may vary regionally, requiring an examination of habitat assessment elements and biotic metrics and a test of the presumed relationship between them. Bollman (1998) has recently studied the assemblages of the Montana Valleys and Foothill Prairies ecoregion, and has recommended a battery of metrics applicable to the montane ecoregions of western Montana. This metric battery has been shown to be sensitive to impairment, related to habitat assessment parameters, and consistent over replicated samples.

Habitat assessment enhances the interpretation of biological data (Barbour and Stribling 1991), because there is generally a direct response of the biological community to habitat degradation in the absence of water quality impairment. If biotic health appears more damaged than the habitat quality would predict, water pollution by metals, other toxicants, high water temperatures, or high levels of organic and/or nutrient pollution might be suspected. On the other hand, an "artificial" elevation of biotic condition in the presence of habitat degradation may be due to the paradoxical effect of mild nutrient or organic enrichment in an oligotrophic setting.

METHODS

Aquatic invertebrates were sampled by Montana DEQ personnel on August 8 and 9, 2001 from four sites in the Bitterroot River watershed. Sample designations and site locations are indicated in Table 1. The sampling method employed was that recommended in the Montana Department of Environmental Quality (DEQ) Standard Operating Procedures for Aquatic Macroinvertebrate Sampling (Bukantis 1998). In addition to aquatic invertebrate sample collection, habitat quality was visually evaluated at each site and reported by means of the habitat assessment protocols recommended by Bukantis (1998) for streams with riffle/run prevalence.

Evaluated habitat features include instream conditions, larger-scale channel conditions including flow status, streambank condition, and extent of the riparian zone. Scores were assigned in the field to each habitat measure, and these scores were totaled and compared to the maximum possible score to give an overall assessment of habitat.

Aquatic invertebrate samples and associated habitat data were delivered to Rhithron Biological Associates, Missoula, Montana, for laboratory and data analyses. In the laboratory, the Montana DEQ-recommended sorting method was used to obtain subsamples of at least 300 organisms from each sample, when possible. Organisms were identified to the lowest possible taxonomic levels consistent with Montana DEQ protocols.

To assess aquatic invertebrate communities in this study, a multimetric index developed in previous work for streams of western Montana ecoregions (Bollman 1998) was used. Multimetric indices result in a single numeric score, which integrates the values of several individual indicators of biologic health. Each metric used in this index was tested for its response or sensitivity to varying degrees of human influence. Correlations have been demonstrated between the metrics and various symptoms of human-caused impairment as expressed in water quality parameters or instream, streambank and stream reach morphologic features. Metrics were screened to minimize variability over natural environmental gradients, such as site elevation or sampling season, which might confound interpretation of results (Bollman 1998). The multimetric index used in this report incorporates multiple attributes of the sampled assemblage into an integrated score that accurately describes the benthic community of each site in terms of its biologic integrity. In addition to the metrics comprising the index, other metrics, which have been shown to be applicable to biomonitoring in other regions (Kleindl 1995, Patterson 1996, Rossano 1995) were used for descriptive interpretation of results. These metrics include the number of "clinger" taxa, long-lived taxa richness, the percent of predatory organisms, and others. They are not included in the integrated bioassessment score, however, since their performance in western Montana ecoregions is unknown. However, the relationship of these metrics to habitat conditions is intuitive and reasonable.

The six metrics comprising the bioassessment index used in this study were selected because both individually and as an integrated metric battery, they are robust at distinguishing impaired sites from relatively unimpaired sites (Bollman 1998). In addition, they are relevant to the kinds of impacts that are present in the Bitterroot River watershed. They have been demonstrated to be more variable with anthropogenic

Table 1. Sampling locations in the Bitterroot River watershed. August, 2001.

Water body	Site description	Sample name	Latitude Longitude
Moose Creek	not specified	CO5MOOSC01	45° 58' 25" N 113° 42' 44" W
East Fork Bitterroot River	downstream of crossing at USGS gaging station	CO5EFBTR01	45° 52' 56" N 114° 03' 57" W
Bitterroot River	near Darby: just downstream of the Hannon Memorial fishing access boat ramp	CO5BTRTR01	45° 58' 21" N 114° 08' 28" W
Skalkaho Creek	at cableway: upstream from crossing of Hwy. 93	CO5SKLKC01	46° 09' 44" N 113° 57' 09" W

disturbance than with natural environmental gradients (Bollman 1998). Each of the six metrics developed and tested for western Montana ecoregions is described below.

1. **Ephemeroptera (mayfly) taxa richness.** The number of mayfly taxa declines as water quality diminishes. Impairments to water quality which have been demonstrated to adversely affect the ability of mayflies to flourish include elevated water temperatures, heavy metal contamination, increased turbidity, low or high pH, elevated specific conductance and toxic chemicals. Few mayfly species are able to tolerate certain disturbances to instream habitat, such as excessive sediment deposition.
2. **Plecoptera (stonefly) taxa richness.** Stoneflies are particularly susceptible to impairments that affect a stream on a reach-level scale, such as loss of riparian canopy, streambank instability, channelization, and alteration of morphological features such as pool frequency and function, riffle development and sinuosity. Just as all benthic organisms, they are also susceptible to smaller scale habitat loss, such as by sediment deposition, loss of interstitial spaces between substrate particles, or unstable substrate.
3. **Trichoptera (caddisfly) taxa richness.** Caddisfly taxa richness has been shown to decline when sediment deposition affects their habitat. In addition, the presence of certain case-building caddisflies can indicate good retention of woody debris and lack of scouring flow conditions.
4. **Number of sensitive taxa.** Sensitive taxa are generally the first to disappear as anthropogenic disturbances increase. The list of sensitive taxa used here includes organisms sensitive to a wide range of disturbances, including warmer water

temperatures, organic or nutrient pollution, toxic pollution, sediment deposition, substrate instability and others. Unimpaired streams of western Montana typically support at least four sensitive taxa (Bollman 1998).

5. Percent filter feeders. Filter-feeding organisms are a diverse group; they capture small particles of organic matter, or organically enriched sediment material, from the water column by means of a variety of adaptations, such as silken nets or hairy appendages. In forested montane streams, filterers are expected to occur in insignificant numbers. Their abundance increases when canopy cover is lost and when water temperatures increase and the accompanying growth of filamentous algae occurs. Some filtering organisms, specifically the Arctopsychid caddisflies (*Arctopsyche* spp. and *Parapsyche* sp.) build silken nets with large mesh sizes that capture small organisms such as chironomids and early-instar mayflies. Here they are considered predators, and, in this study, their abundance does not contribute to the percent filter feeders metric.

6. Percent tolerant taxa. Tolerant taxa are ubiquitous in stream sites, but when disturbance increases, their abundance increases proportionately. The list of taxa used here includes organisms tolerant of a wide range of disturbances, including warmer water temperatures, organic or nutrient pollution, toxic pollution, sediment deposition, substrate instability and others.

Scoring criteria for each of the six metrics are presented in Table 2. Metrics differ in their possible value ranges as well as in the direction the values move as biological conditions change. For example, Ephemeroptera richness values may range from zero to ten taxa or higher. Larger values generally indicate favorable biotic conditions. On the other hand, the percent filterers metric may range from 0% to 100%; in this case, larger values are negative indicators of biotic health. To facilitate scoring, therefore, metric values were transformed into a single scale. The range of each metric has been divided into four parts and assigned a point score between zero and three. A score of three indicates a metric value similar to one characteristic of a non-impaired condition. A score of zero indicates strong deviation from non-impaired condition and suggests severe degradation of biotic health. Scores for each metric were summed to give an overall score, the total bioassessment score, for each site in each sampling event. These scores were expressed as the percent of the maximum possible score, which is 18 for this metric battery.

Table 2. Metrics and scoring criteria for bioassessment of streams of western Montana ecoregions (Bollman 1998).

	Score			
metric	**3**	**2**	**1**	**0**
Ephemeroptera taxa richness	> 5	5 - 4	3 – 2	< 2
Plecoptera taxa richness	> 3	3 - 2	1	0
Trichoptera taxa richness	> 4	4 - 3	2	< 2
Sensitive taxa richness	> 3	3 - 2	1	0
Percent filterers	0 – 5	5.01 - 10	10.01 – 25	> 25
Percent tolerant taxa	0 – 5	5.01 - 10	10.01 – 35	> 35

The total bioassessment score for each site was expressed in terms of use-support. Criteria for use-support designations were developed by Montana DEQ and are presented in Table 3a. Scores were also translated into impairment classifications according to criteria outlined in Table 3b.

In this report, certain other metrics were used as descriptors of the benthic community response to habitat or water quality but were not incorporated into the bioassessment metric battery, either because they have not yet been tested for reliability in streams of western Montana, or because results of such testing did not show them to be robust at distinguishing impairment, or because they did not meet other requirements for inclusion in the metric battery. These metrics and their use in predicting the causes of impairment or in describing its effects on the biotic community are described below.

- The modified biotic index. This metric is an adaptation of the Hilsenhoff Biotic Index (HBI, Hilsenhoff 1987), which was originally designed to indicate organic enrichment of waters. Values of this metric are lowest in least impacted conditions. Taxa tolerant to saprobic conditions are also generally tolerant of warm water, fine sediment and heavy filamentous algae growth (Bollman, unpublished data). Loss of canopy cover is often a contributor to higher biotic index values. The taxa values used in this report are modified to reflect habitat and water quality conditions in Montana (Bukantis 1998). Ordination studies of the benthic fauna of Montana's foothill prairie streams showed that there is a correlation between modified biotic index values and water temperature, substrate embeddedness, and fine sediment (Bollman 1998). In a study of reference streams, the average value of the modified biotic index in least-impaired streams of western Montana was 2.5 (Wisseman 1992).
- Taxa richness. This metric is a simple count of the number of unique taxa present in a sample. Average taxa richness in samples from reference streams in western Montana was 28 (Wisseman 1992). Taxa richness is an expression of biodiversity, and generally decreases with degraded habitat or diminished water quality. However, taxa richness may show a paradoxical increase when mild nutrient enrichment occurs in previously oligotrophic waters, so this metric must be interpreted with caution.
- Percent predators. Aquatic invertebrate predators depend on a reliable source of invertebrate prey, and their abundance provides a measure of the trophic complexity supported by a site. Less disturbed sites have more plentiful habitat niches to support diverse prey species, which in turn support abundant predator species.
- Number of "clinger" taxa. So-called "clinger" taxa have physical adaptations that allow them to cling to smooth substrates in rapidly flowing water. Aquatic invertebrate "clingers" are sensitive to fine sediments that fill interstices between substrate particles and eliminate habitat complexity. Animals that occupy the hyporheic zones are included in this group of taxa. Expected "clinger" taxa richness in unimpaired streams of western Montana is at least 14 (Bollman, unpublished data).

- Number of long-lived taxa. Long-lived or semivoltine taxa require more than a year to completely develop, and their numbers decline when habitat and/or water quality conditions are unstable. They may completely disappear if channels are dewatered or if there are periodic water temperature elevations or other interruptions to their life cycles. Western Montana streams with stable habitat conditions are expected to support six or more long-lived taxa (Bollman, unpublished data).

Table 3a. Criteria for the assignment of use-support classifications / standards violation thresholds (Bukantis, 1997).

% Comparability to reference	Use support
>75	Full support--standards not violated
25-75	Partial support--moderate impairment--standards violated
<25	Non-support--severe impairment--standards violated

Table 3b. Criteria for the assignment of impairment classifications (Plafkin et al. 1989).

% Comparability to reference	Classification
> 83	nonimpaired
54-79	slightly impaired
21-50	moderately impaired
<17	severely impaired

RESULTS

Habitat assessment

Figure 1 compares habitat assessment results for the 4 sites visited. Table 4 itemizes the evaluated habitat parameters and shows the assigned scores for each.

Figure 1. Total habitat assessment scores for 4 sites in the Bitterroot River watershed. August 8-9, 2001.

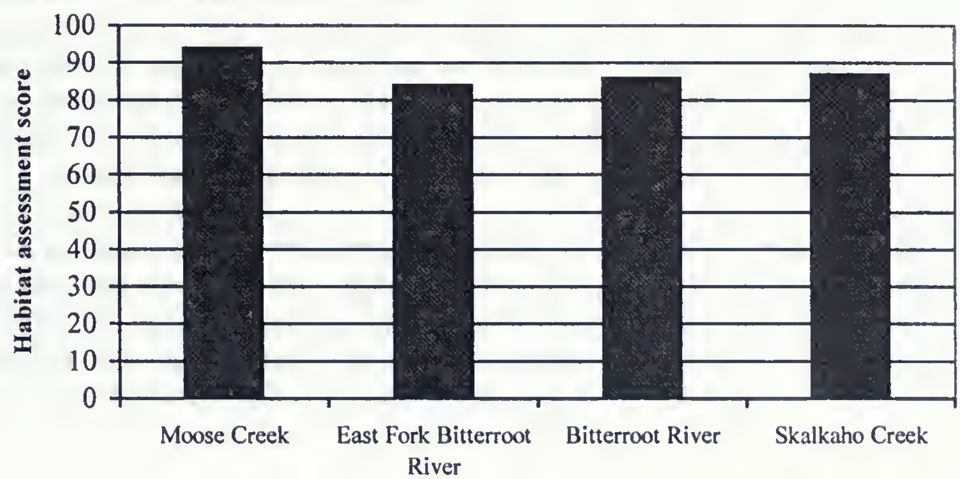


Table 4. Stream and riparian habitat assessment. Four sites in the Bitterroot River watershed. August 8-9, 2001.

Max. possible score	Parameter	Moose Creek	East Fork Bitterroot River	Bitterroot River	Skalkaho Creek
10	Riffle development	7	10	10	8
10	Benthic substrate	10	7	8	8
20	Embeddedness	20	18	18	13
20	Channel alteration	17	15	17	20
20	Sediment deposition	19	15	16	17
20	Channel flow status	20	19	17	20
20	Bank stability: left / right	10 / 10	10 / 8	10 / 8	7 / 9
20	Vegetated zone: left / right	10 / 10	10 / 8	10 / 8	10 / 8
20	Riparian zone width: left / right	7 / 10	7 / 7	9 / 7	9 / 10
160	Total	150	134	138	139
	Percent of maximum CONDITION*	**94 OPTIMAL**	**84 OPTIMAL**	**86 OPTIMAL**	**87 OPTIMAL**

*Condition categories: Optimal > 80% of maximum score; Sub-optimal 75 - 56%; Marginal 49 - 29%; Poor <23%. From Plafkin et al. 1988.

Habitat assessment scores indicate sub-optimal conditions at all four studied sites. Instream habitat parameters were judged optimal or sub-optimal at all sites; benthic substrates were noted to be diverse with cobbles dominant. Some fine sediment deposition was noted at the East Fork Bitterroot River site. The maximum amount of substrate embeddedness recorded was 20-25%.

Streambanks were perceived to be moderately or very stable at all sites; some potential for bank erosion was noted at some of the sites studied. Riparian zone width was generally optimal, or at most minimally limited.

Bioassessment

Figure 2 summarizes bioassessment scores for aquatic invertebrate communities sampled at the 2 sites in this study. Table 5 itemizes each contributing metric and shows individual metric scores for each site. Tables 3a and 3b show criteria for impairment classifications and use-support categories recommended by Montana DEQ.

When this bioassessment method is applied to these data, scores indicate that biotic health was unimpaired at the Moose Creek and Skalkaho Creek sites, and slightly impaired at both of the riverine sites. Full support of designated uses was suggested by scores calculated for all 4 sites.

All bioassessment metrics scored maximally in the Moose Creek community analysis. The East Fork Bitterroot River assemblage supported a greater proportion of tolerant taxa than expected, and the Bitterroot River site had a somewhat greater proportion of both filter-feeders and tolerant taxa than anticipated. The proportion of tolerant taxa was also somewhat elevated at the Skalkaho Creek site.

Figure 2. Bioassessment scores for 4 sites in the Bitterroot River watershed. August 8-9, 2001. Revised bioassessment metrics and criteria (Bollman 1998) used as reference.

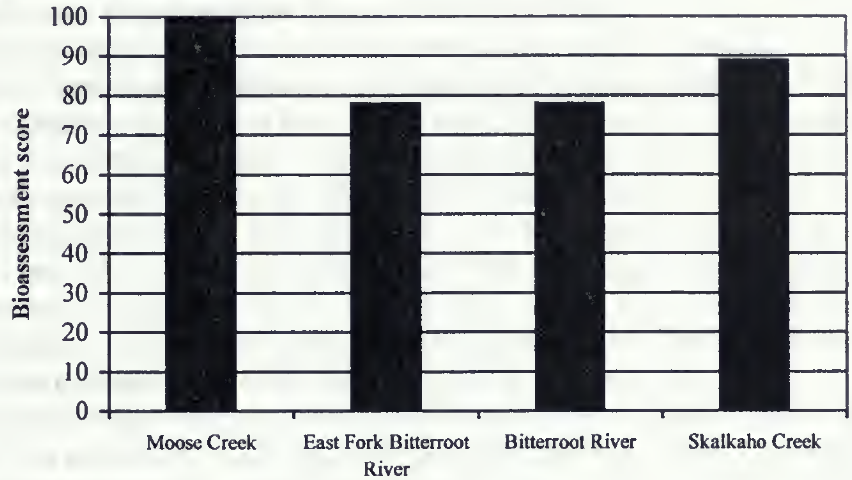


Table 5. Metric values and bioassessments for 4 sites in the Bitterroot River watershed. August 8-9, 2001. Revised bioassessment metrics and criteria (Bollman 1998) used as reference.

	SITES			
	Moose Creek	East Fork Bitterroot River	Bitterroot River	Skalkaho Creek
METRICS	**METRIC VALUES**			
Ephemeroptera richness	6	8	9	9
Plecoptera richness	4	4	4	5
Trichoptera richness	5	6	8	5
Number of sensitive taxa	3	5	5	9
Percent filterers	0	5	10	0
Percent tolerant taxa	3	46	22	12
	METRIC SCORES			
Ephemeroptera richness	3	3	3	3
Plecoptera richness	3	3	3	3
Trichoptera richness	3	3	3	3
Number of sensitive taxa	3	3	3	3
Percent filterers	3	2	1	3
Percent tolerant taxa	3	0	1	1
TOTAL SCORE (max.=18)	18	14	14	16
PERCENT OF MAX.	**100**	**78**	**78**	**89**
Impairment classification*	**NON**	**SLI**	**SLI**	**NON**
USE SUPPORT †	**FULL**	**FULL**	**FULL**	**FULL**

1. Classifications: (NON) non-impaired, (SLI) slightly impaired, (MOD) moderately impaired, (SEV) severely impaired. See Table 3b.

*Use support designations: See Table 3a.

Aquatic insect communities

The low biotic index value (2.34) calculated for the assemblage collected at the Moose Creek site suggests unimpaired water quality, and this hypothesis is supported by the rich and diverse mayfly fauna encountered there. Three cold-stenothermic taxa were collected at the site. Together these findings imply cold clean water. However, there is some disturbing evidence to be found in the assemblage, which is consistent with metals contamination. Heptageniid mayflies are represented by a single specimen of the ubiquitous *Cinygmula* sp. In most montane streams, members of this family are abundant and the fauna is rich; their absence in environs where they are expected is a well-known signal of metals pollution (Clements 1994). The elevated metals tolerance index (6.97) calculated for the assemblage is likely attributable to the "bloom" of the midge *Pagastia* sp., which is reported by McGuire (*in* Bukantis 1998) as being extremely tolerant to metals. While such findings may simply be serendipitous, the possibility that they reflect the results of metals impacts attributable to mines in the Moose Creek headwaters or elsewhere in the drainage cannot be ruled out with the evidence at hand.

Instream habitats were apparently unaffected by fine sediment deposition, since 14 "clinger" taxa as well as 5 caddisfly taxa were collected here. Reach-scale habitats were apparently unaffected by human disturbances, since a rich stonefly fauna was supported at the site. Only 3 long-lived taxa were collected at the site, somewhat fewer than expected, and these taxa comprised only 6 percent of the sampled assemblage. The possibility that some catastrophic event recently interrupted long life cycles at the site must also be considered.

Functionally, the assemblage is skewed strongly toward gatherers, another result of the "bloom" of *Pagastia* sp. Randomly encountering a "bloom" is a potential pitfall of aquatic invertebrate sampling, especially when samples are not replicated. However, the possibility that the abundance of this organism and the skewed functional composition of the assemblage represent the effects of a toxic pollutant cannot be ruled out.

The benthic assemblage collected at the East Fork Bitterroot River site yielded a biotic index value (3.72) within expectations for an unpolluted montane river. Eight mayfly taxa also contribute evidence of clean water. Five cold-stenothermic taxa, including the mayflies *Drunella spinifera* and *Drunella grandis*, were present, implying low water temperatures.

Instream habitat indicators suggest that substrates were essentially unimpaired by fine sediment deposition; sixteen "clinger" taxa and 6 caddisfly taxa were collected here. Four stonefly species were supported at the site, suggesting that reach-scale habitat features, such as streambanks, channel morphology, and riparian zone function were largely free of human disturbances. More than 9 percent of sampled animals were shredders; these included the salmonfly *Pteronarcys princeps*, and implied that riparian inputs of large organic debris were ample, and that flow and channel conditions were conducive to the retention of such material. Nine semi-voltine taxa were collected, suggesting that dewatering or other catastrophic interruptions of long life cycles were not a recent phenomenon. The functional composition of the assemblage did not lack any expected elements.

At the Hannon Fishing Access, the Bitterroot River supported a diverse and sensitive benthic assemblage characteristic of an unimpaired montane river. The biotic index value (2.77) suggests clean water, and the rich mayfly fauna supports this

hypothesis. Five sensitive, cold-stenothermic taxa, including the caddisfly *Apatania* sp., were collected here.

Benthic substrates were apparently unimpaired by fine sediment deposition, since 21 "clinger" taxa were present. Eight caddisfly taxa were also collected. Excellent reach-scale habitats are suggested by the presence of 4 stonefly taxa. The site supported 7 long-lived taxa, implying year-round flows and absence of catastrophic pollution events. All expected functional elements of a balanced benthic community were present.

On Skalkaho Creek, the sampled site yielded a taxonomically diverse, sensitive assemblage; the biotic index value (1.63) suggests water quality unimpaired by nutrient or thermal impacts. The 9 mayfly taxa present at the site also suggest clean water. Nine cold-stenotherms imply low water temperatures.

Clean substrates provided habitats for 17 "clinger" taxa. Fine sediment deposition apparently did not substantially affect biotic health here. The stonefly fauna included 5 taxa, among which were the sensitive perlodids *Megarcys* sp. and *Kogotus* sp.; this suggests that reach-scale habitat features such as riparian zone function, streambank stability, and channel morphology were essentially unimpaired by human disturbance. Although only 3 long-lived taxa were present at the site, they were plentiful in numbers, comprising 23 percent of the sampled assemblage. This suggests that dewatering or other catastrophes did not recently short-circuit long life cycles. Functionally, the assemblage was not very diverse, being skewed toward gatherers; shredders comprised a much smaller proportion of the functional composition than expected. This may indicate that riparian inputs of large organic debris were lacking, or that flow or morphological conditions did not favor retention of such material.

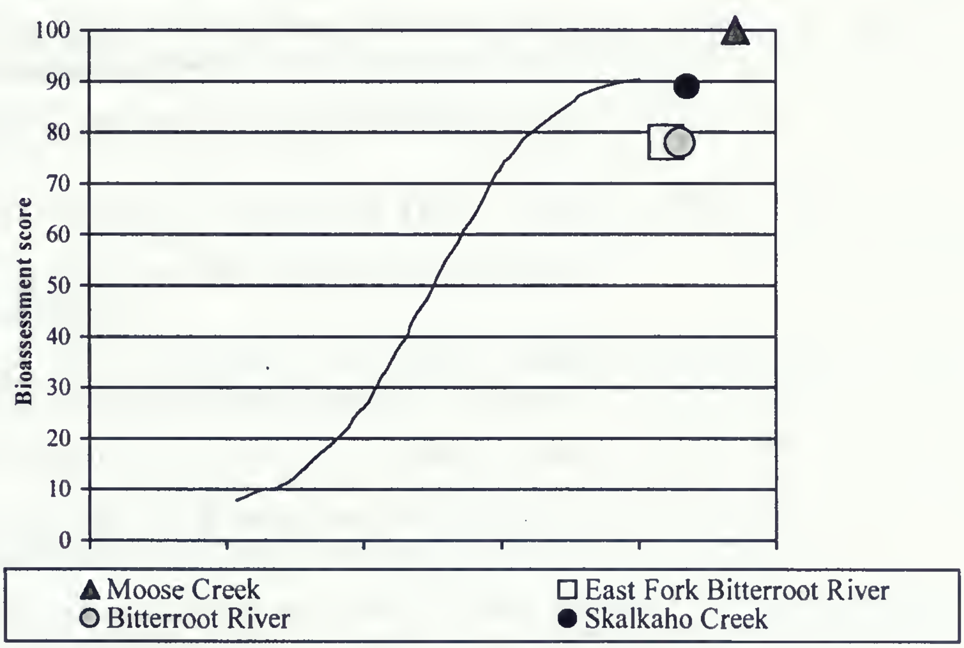
CONCLUSIONS

- At the Moose Creek site, benthic indicators suggested that habitats were essentially unimpaired by human disturbance. However, there was some evidence that could be interpreted as suggesting that water quality was impaired by metals contamination.
- The assemblage collected at the site on the East Fork of the Bitterroot River was characteristic of an unimpaired montane river in both taxonomic and functional characteristics. The evaluation of "slight" impairment based on the performance of metrics probably suggests the limitations of the bioassessment method for evaluating riverine sites. The MT DEQ method (see Appendix) more accurately evaluates this site.
- The assemblage collected at the Hannon Fishing Access on the Bitterroot River was also characteristic of an unimpaired montane river in both taxonomic and functional characteristics. Again, the evaluation of "slight" impairment based on the performance of metrics probably suggests the limitations of the bioassessment method for evaluating riverine sites. The MT DEQ method (see Appendix) more accurately evaluates this site.
- At the Skalkaho Creek site, water quality indicators suggested clean cold water and habitat indicators suggested diverse and unimpaired habitats. Functionally, however, the assemblage was limited by a dearth of shredders and an abundance

of gatherers, suggesting a lack of riparian inputs, scouring flows, or monotonous channel features.

- The relationship between habitat assessment scores and bioassessment scores is illustrated in Figure 3. The red curve in the center of the graph represents the hypothetical relationship between habitat quality and biotic health when habitat degradation is the sole source of impairment to benthic assemblage health (Barbour and Stribling 1991). Given the excellent habitat assessment scores, bioassessment scores for the 2 riverine sites (East Fork Bitterroot River and Bitterroot River) were somewhat lower than expected, suggesting mild water quality impairment. However, these scores likely illustrate the limitations of the bioassessment method utilized here for assessing riverine sites. In both cases, the MT DEQ metric battery assigns higher scores to these sites. See the Appendix for the results of this assessment method.

Figure 3. The relationship of habitat assessment scores and bioassessment scores for 4 sites in the Bitterroot River watershed, August 8-9, 2001. The red curve represents the hypothetical relationship between habitat scores and bioassessment scores if habitat quality solely determined biotic health.



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APPENDIX

Taxonomic data and summaries

Bitterroot River watershed

August 8-9, 2001

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office products

Report Binder

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